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PATENT

Atty. Docket No. 678-154 (P8378-US/STN)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Assistant Commissioner for Patents
Washington, D.C. 20231

UTILITY APPLICATION FEE TRANSMITTAL

Sir:

Transmitted herewith for filing is the patent application of

Inventor(s): Roe-Kwan KIM

For: METHOD FOR TRANSMITTING SHORT MESSAGE TO
CALLED SUBSCRIBERS

Enclosed are:

- [X] 15 page(s) of Specification
[X] 7 page(s) of Claims
[X] 1 page(s) of Abstract
[X] 8 sheets of drawings [] formal [X] informal
[X] 2 page(s) of Declaration and Power of Attorney
[X] An Assignment of the invention to Samsung Electronics Co.,

Ltd.

CERTIFICATION UNDER 37 C.F.R. § 1.10

I hereby certify that this New Application Transmittal and the documents referred to as enclosed therein are being deposited with the United States Postal Service on this date August 12, 1998 in an envelope as "Express Mail Post Office to Addressee" Mail Label Number EL071685343US addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

Frank V. DeRosa

(Type or print name of person mailing paper)

Frank V. DeRosa
(Signature of person mailing paper)

[] This application claims the benefit under 35 U.S.C. §119(e) of U.S. Provisional Application(s) No(s)..

APPLICATION NO(S)..
_____/_____
_____/_____

FILING DATE

[X] Certified copy of application

<u>Country</u>	<u>Appln. No.</u>	<u>Filed</u>
<u>Korea</u>	<u>38430/1997</u>	<u>12 August 1997</u>

from which priority under Title 35 United States Code, § 119
is claimed

[x] is enclosed.

[] will follow.

CALCULATION OF UTILITY APPLICATION FEE

For	Number Filed	Number Extra	Rate	Basic Fee \$790.00
Total				
Claims*	14 - 20 =	0	x \$ 22.00	\$ -0-
Independent				
Claims	3 - 3 =	0	x \$ 82.00	\$ -0-
Dependent				
Claims	[x] no	Add'l. Fee	None	= \$ -0-
			TOTAL	\$790.00

[] Verified Statement of "Small Entity" Status Under 37 C.F.R. § 1.27. Reduced fees under 37 C.F.R. § 1.9(f) (50% of total) paid herewith \$_____.

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Date: August 12, 1998



SIGNATURE OF ATTORNEY

Paul D. Ackerman
Reg. No. 39,891

DILWORTH & BARRESE
333 Earle Ovington Blvd.
Uniondale, NY 11553
Tel. No. (516) 228-8484
Fax. (516) 228-8516

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UTILITY PATENT APPLICATION TRANSMITTAL <small>(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))</small>	Attorney Docket No.	678-154 (P8378-US/STN)
	First Inventor or Application Identifier	Roe-Kwan KIM
	Title	METHOD FOR TRANSMITTING SHORT...
	Express Mail Label No.	EL071685343US

APPLICATION ELEMENTS <small>See MPEP chapter 600 concerning utility patent application contents.</small>	ADDRESS TO: Assistant Commissioner for Patents Box Patent Application Washington, DC 20231
1. <input checked="" type="checkbox"/> * Fee Transmittal Form (e.g., PTO/SB/17) <small>(Submit an original and a duplicate for fee processing)</small>	6. <input type="checkbox"/> Microfiche Computer Program (Appendix)
2. <input checked="" type="checkbox"/> Specification <small>[Total Pages 23]</small> <small>(preferred arrangement set forth below)</small> <ul style="list-style-type: none">- Descriptive title of the Invention- Cross References to Related Applications- Statement Regarding Fed sponsored R & D- Reference to Microfiche Appendix- Background of the Invention- Brief Summary of the Invention- Brief Description of the Drawings (if filed)- Detailed Description- Claim(s)- Abstract of the Disclosure	7. Nucleotide and/or Amino Acid Sequence Submission <small>(if applicable, all necessary)</small> <ul style="list-style-type: none">a. <input type="checkbox"/> Computer Readable Copyb. <input type="checkbox"/> Paper Copy (identical to computer copy)c. <input type="checkbox"/> Statement verifying identity of above copies
3. <input checked="" type="checkbox"/> Drawing(s) (35 U.S.C. 113) <small>[Total Sheets 8]</small>	ACCOMPANYING APPLICATION PARTS
4. Oath or Declaration <small>[Total Pages 2]</small> <ul style="list-style-type: none">a. <input checked="" type="checkbox"/> Newly executed (original or copy)b. <input type="checkbox"/> Copy from a prior application (37 C.F.R. § 1.63(d)) <small>(for continuation/divisional with Box 17 completed)</small> <small>[Note Box 5 below]</small><ul style="list-style-type: none">i. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).	8. <input checked="" type="checkbox"/> Assignment Papers (cover sheet & document(s))
5. <input type="checkbox"/> Incorporation By Reference (useable if Box 4b is checked) The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered to be part of the disclosure of the accompanying application and is hereby incorporated by reference therein.	9. <input type="checkbox"/> 37 C.F.R. § 3.73(b) Statement <input checked="" type="checkbox"/> Power of Attorney <small>(when there is an assignee)</small>
	10. <input type="checkbox"/> English Translation Document (if applicable)
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	12. <input type="checkbox"/> Preliminary Amendment
	13. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) <small>(Should be specifically itemized)</small>
	14. <input type="checkbox"/> * Small Entity Statement(s) <input type="checkbox"/> Statement filed in prior application, Status still proper and desired <small>(PTO/SB/09-12)</small>
	15. <input checked="" type="checkbox"/> Certified Copy of Priority Document(s) <small>(if foreign priority is claimed)</small>
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17. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

<input type="checkbox"/> Continuation	<input type="checkbox"/> Divisional	<input type="checkbox"/> Continuation-in-part (CIP)	of prior application No: _____
Prior application information: Examiner _____			Group / Art Unit: _____

18. CORRESPONDENCE ADDRESS

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--	---	---

Name	Frank Chau, Esq. Dilworth & Barrese				
Address	333 Earle Ovington Blvd.				
City	Uniondale	State	NY	Zip Code	11553
Country	USA	Telephone	(516) 228-8484	Fax	(516) 228-8516

Name (Print/Type)	Paul D. Ackerman	Registration No. (Attorney/Agent)	39,891
Signature		Date	August 12, 1998

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These are the fees effective October 1, 1997.

Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12. See 37 C.F.R. §§ 1.27 and 1.28.

TOTAL AMOUNT OF PAYMENT (\$)**790.00**

Complete if Known

Application Number	
Filing Date	August 12, 1998
First Named Inventor	Roe-Kwan KIM
Examiner Name	
Group / Art Unit	
Attorney Docket No.	678-154 (P8378-US/STN)

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

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Deposit Account Name **Dilworth & Barrese**

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
101 790	201 395	Utility filing fee	790
106 330	206 165	Design filing fee	
107 540	207 270	Plant filing fee	
108 790	208 395	Reissue filing fee	
114 150	214 75	Provisional filing fee	
SUBTOTAL (1) (\$)			790

2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
14	-20** = 0	X 22	= 0
Independent Claims	3	-3** = 0	X 82
Multiple Dependent			

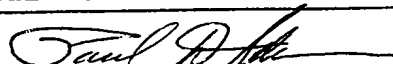
**or number previously paid, if greater; For Reissues, see below

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
103 22	203 11	Claims in excess of 20	
102 82	202 41	Independent claims in excess of 3	
104 270	204 135	Multiple dependent claim, if not paid	
109 82	209 41	** Reissue independent claims over original patent	
110 22	210 11	** Reissue claims in excess of 20 and over original patent	
SUBTOTAL (2) (\$)			0

3. ADDITIONAL FEES

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet.	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 400	216 200	Extension for reply within second month	
117 950	217 475	Extension for reply within third month	
118 1,510	218 755	Extension for reply within fourth month	
128 2,060	228 1,030	Extension for reply within fifth month	
119 310	219 155	Notice of Appeal	
120 310	220 155	Filing a brief in support of an appeal	
121 270	221 135	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,320	241 660	Petition to revive - unintentional	
142 1,320	242 660	Utility issue fee (or reissue)	
143 450	243 225	Design issue fee	
144 670	244 335	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Petitions related to provisional applications	
126 240	126 240	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	40
146 790	246 395	Filing a submission after final rejection (37 CFR 1.129(a))	
149 790	249 395	For each additional invention to be examined (37 CFR 1.129(b))	
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Other fee (specify) _____			
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SUBTOTAL (3) (\$)			40

SUBMITTED BY:

Typed or Printed Name	Paul D. Ackerman	Reg. Number	39,891
Signature		Date	8/12/98
		Deposit Account User ID	04-1121

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METHOD FOR TRANSMITTING SHORT MESSAGE TO CALLED SUBSCRIBERS

BACKGROUND

1. Technical Field

5 The present application relates generally to a method for transmitting short messages in a mobile communication system and, in particular, to a method for simultaneously transmitting a short message to a plurality of called subscribers in a GSM (Global System for Mobile Communication) system.

2. Description of the Related Art

10 A GSM system is a European cellular mobile telephone system in which traffic and signaling information is transmitted as a digital signal in TDMA (Time Division Multiple Access) format. In general, the signaling and traffic information transmitted between a base transceiver station and a GSM terminal has a burst form of 156.25 bits. Particularly, the data burst of the traffic channel includes
15 3 start bits, 58 message bits, 26 trailing sequence bits, 58 new message bits, and 3 stop bits. In addition, a guard space exists between successive bursts to distinguish between them, making the total length of a burst equal to 156.26 bits (with a burst time of 0.577 ms). Data bursts of other channels have 8 respective frames which are sequentially positioned on a radio channel frequency. These data bursts include
20 compressed digital traffic information, voice information and character information.

Referring now to FIG. 1, a block diagram illustrates a GSM system in which the present method for transmitting short messages can be implemented. A

home location register (HLR) 160 contains data for each of a plurality of mobile subscribers such as a home location of each subscriber and an address of a service center in which a short message for a GSM terminal is stored. The address of the service center is deleted after the short message is transmitted. A visitor location register (VLR) 150 includes data such as an actual or latest known location of a subscriber, an ON/OFF state of a GSM terminal and a secret number. A mobile switching center (MSC) 100 is connected to another MSC 200, a public switched telephone network (PSTN), an integrated services digital network (ISDN), and a short message service center 180. A first base station subsystem (BSS) 110 includes a base station controller (BSC) 112 and a plurality of base transceiver stations (BTSs) 114 and 116. A second base station subsystem (BSS) 120 includes a base station controller (BSC) 122 and a plurality of base transceiver stations (BTSs) 124 and 126. The BSCs 112 and 122 are connected to the MSC 100 and to at least one BTS (e.g., one of the BTSs 114, 116, 124, and 126). In addition, the BTSs 114 and 124 control the transmission of a message between a corresponding one of GSM terminals 10, 20, 30 and 40 and the MSC 100, and forms a radio link to transmit voice and data signals.

A subscriber authenticator 140, operatively coupled to the MSC 100, confirms an authentication number (or "secret number") of a subscriber in order to prevent other mobile subscribers from fraudulently using the identification of another subscriber. The short message service center 180 stores data such as short messages and (as explained in further detail below) a group identifier and a plurality of

addresses associated with the group identifier. The telephone numbers of called subscribers are stored in these addresses. If a short message cannot be transmitted to the called subscriber number (i.e., the terminal of the called subscriber is busy or the called subscriber does not answer a call), the short message service center 180 repeatedly attempts to transmit the short message by a preset number of times. Short message service gateways 170 and 190 connect MSCs 100 and 200, respectively, to the short message service center 180.

Referring now to FIG. 2, a block diagram illustrates a GSM terminal (e.g., the GSM terminal 10 of FIG. 1) in which the present method for transmitting a short message can be implemented. A controller 1 controls the overall operation of the GSM terminal. For example, the controller 1 causes the GSM terminal to generate short message group registration information for transmitting a short message during a "short message group transmission mode" (as explained in further detail below). A memory 2 stores various programs that are used by the controller 1 for performing short message group transmission and stores data generated during the execution of these programs. A key entry unit 3 has a plurality of numeric keys and function keys and generates key data. A display unit 4 displays the key data generated from the key entry unit 3, and displays the operating status of the GSM terminal. An audio circuit 6 converts an audio signal received through a microphone MIC, as well as data received from the controller 1, into an intermediate frequency signal. Further, the audio circuit 6 processes an intermediate frequency signal received from an RF circuit 5, and supplies processed data to the controller 1 and a

processed audio signal to a speaker SP. The radio frequency (RF) circuit 5 demodulates an RF signal received through an antenna AT into an intermediate frequency signal. Moreover, the RF circuit 5 modulates an intermediate frequency signal received from the audio circuit 6 into an RF signal and transmits the RF signal through the antenna AT.

A conventional short message transmission operation will now be discussed with reference to FIGs. 1 and 2. If a menu key on the key entry unit 3 of the GSM terminal (e.g., GSM terminal 10) is selected, the controller 1 causes the display unit 4 to display a plurality of menus. If a short message service menu is selected among the displayed menus, the controller 1 instructs the calling subscriber to sequentially input a short message service center number, a short message, and a destination address (i.e., a called subscriber). Conventionally, only one destination address can be input. Once the short message service center number, short message and destination address are input, the controller 1 determines if a transmit key (from the key entry unit 3) is selected. If the transmit key is selected, the controller 1 transmits the short message information (i.e., the service center number, the short message and the destination address) through the RF circuit 5 in the prescribed data burst format.

Referring again to FIG. 1, the BTS 114, for example, receives the short message information transmitted from the GSM terminal 10 and then transmits the information to the BSC 112. The BSC 112 then transmits the short message information to the MSC 100. The MSC 100 detects the called subscriber number

included in the short message information and determines if the called subscriber number is a registered subscriber number. If the called number is a registered subscriber number, the MSC 100 will detect the service center number (i.e., the service center address) from the short message information and the MSC 100 is then switched to the short message service center 180. The service center address is temporarily stored in the HLR 160. The short message information is matched through the short message service gateway 170 and transmitted to the short message service center 180. The short message service center 180 stores the short message information and detects the destination address. The short message service center 180 then transmits the short message to the destination address via the MSC 100. If the destination address is the GSM terminal 40, for example, the short message service center 180 will transmit the short message to the GSM terminal 40. If the GSM terminal 40 is busy or the call is not answered, the short message service center 180 repeatedly attempts to transmit the short message by a preset number of times.

As demonstrated above, the short message is transmitted to a particular destination terminal by point-to-point links. Moreover, when the calling subscriber wants to transmit a short message to a plurality of terminals using the conventional method discussed above, the short message must be transmitted to each of the terminals one by one (i.e., only one destination address can be designated via the GSM terminal for each set of short message information transmitted to, and processed by, the corresponding MSC).

SUMMARY OF THE INVENTION

5 The present application is directed to a method for simultaneously transmitting a short message to a plurality of GSM subscribers (i.e., mobile terminals). In one aspect, in a mobile communication system having a plurality of base station subsystems for demodulating signals received from a plurality of corresponding mobile communication terminals and a mobile switching center, operatively connected to the plurality of base station subsystems, for detecting a short message service center number from the demodulated signals and for switching to a corresponding short message service center through a gateway, the short message service center having a memory, a method for transmitting a short message to a plurality of subscribers, comprising the steps of:

10 transmitting short message information from one of the mobile communication terminals, the short message information including a group identifier and a short message;

15 detecting, by the short message service center, the group identifier from the short message information; and

simultaneously transmitting said short message to subscriber numbers associated with said detected group identifier.

20 These and other objects, features and advantages of the present invention will become apparent from the following detailed description of illustrative embodiments thereof, which is to be read in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a GSM system in which the present method for transmitting short messages can be implemented;

FIG. 2 is a block diagram of a GSM terminal in which the present method for transmitting short messages can be implemented;

FIGs. 3A and 3B illustrate a flow diagram of a method for transmitting a short message by a GSM terminal in a GSM system according to one aspect of the present invention;

FIG. 4 is a flow diagram illustrating a short message group registration mode routine of FIG. 3A according to one aspect of the present invention;

FIG. 5 is a flow diagram illustrating a method for transmitting a short message by a short message service center in a GSM system according to one aspect of the present invention;

FIG. 6 is a flow diagram illustrating a short message group registration mode routine of FIG. 5 according to one aspect of the present invention; and

FIG. 7 is a block diagram of an embodiment of a short message service center.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

In the following description of preferred embodiments, specific details are set forth to provide a more thorough understanding of the present invention. It is to be understood, however, that a detailed description of related functions or constructions which are known by those of ordinary skill in the art will not be

provided where such description would obscure the subject matter of the present invention.

Referring now to FIGs. 3A and 3B, a flow diagram illustrates a method for transmitting a short message by a GSM terminal in a GSM system according to one aspect of the present invention. Initially, the controller 1 determines if a menu key on the key entry unit 3 is selected (step 300). If the menu key is selected (affirmative decision in step 300), the controller 1 causes the display unit 4 to display menus such as a short message service menu and a secret number change menu (step 302). Next, a determination is made as to whether the short message service menu is selected among the displayed menus (step 303). If the short message service menu is selected (affirmative decision at step 303), the controller 1 causes the display unit 4 to display sub-menus such as a short message transmission mode and a short message group registration mode. If the short message transmission mode is selected among the displayed sub-menus (affirmative decision at step 304), the controller 1 causes the display unit 4 to instruct the calling subscriber to input a service center address which is a short message service center number (step 305). On the other hand, if the short message transmission mode is not selected (negative decision in step 304), a determination is made as to whether the short message group registration mode is selected among the displayed sub-menus (step 317). If the short message group registration mode is selected (affirmative decision in step 317), the controller 1 performs a short message group registration mode routine (step 318) (which is explained in further detail below with reference to FIG. 4).

After the calling subscriber is instructed to input a service center address (step 305), a determination is made as to whether the short message service center address is input (step 306). If the short message service center address is input (affirmative decision at step 306), it is stored in the memory 2 (step 307). Next, the calling subscriber will select one of a group transmission mode and a normal mode, which are displayed on the display unit 4 under the control of the controller 1. If the group transmission mode is selected (affirmative result at step 308), the calling subscriber is instructed to input a group identifier to which the short message is transmitted (step 309). If the group transmission mode is not selected (negative result at step 308) (i.e., if the normal mode is selected at step 308), the controller 1 executes a normal short message mode (step 319) (as discussed above).

After the calling subscriber is instructed to input a group identifier (step 309), the controller 1 determines if the group identifier is input (step 310). If the group identifier is input (affirmative decision at step 310), it is stored in the memory 2 (step 311). The calling subscriber is then instructed to input a short message (step 312). A determination is then made as to whether a short message end key is selected (step 313, FIG. 3B). If the short message end key is selected (affirmative decision at step 313), the short message is stored in the memory 2 (step 314). The controller 1 then determines if a transmit key is selected (step 315). If the transmit key is selected (affirmative decision at step 315), the controller 1 transmits the stored short message service center address, group identifier and short message (i.e., short message information) with a normal burst format through the RF circuit 5 (step 316). In

particular, the RF circuit 5 modulates the short message information into a radio signal under the control of the controller 1, and transmits the modulated radio signal through the antenna.

Referring now to FIG. 4, a flow diagram illustrates the short message group registration mode routine (step 318 in FIG. 3A) in accordance with one aspect of the present invention. If the short message group registration mode is selected among the displayed sub-menus (affirmative decision at step 317 of FIG. 3A), the controller 1 enters the short message group registration mode routine. The calling subscriber is then instructed (via the controller 1) to input a short message service center address (step 401). A determination is made as to whether the service center address is input (step 402). If the service center address is input (affirmative decision at step 402), it is stored in the memory 2 (step 403). The calling subscriber is then instructed to input a group identifier (step 404). The controller 1 then determines if the group identifier is input (step 405). If the group identifier is input (affirmative decision at step 405), it is stored in the memory 2 (step 406). The calling subscriber is then instructed to input a destination address, i.e., a called subscriber number (step 407). A determination is then made as to whether the destination address is input (step 408). If the destination address is input (affirmative decision at step 408), it is stored in the memory 2 (step 409).

The controller 1 then determines if a destination address end key is selected (step 410). If it is not selected (negative decision at step 410), the calling subscriber is instructed to input another destination address (return to step 407). In

this manner, the calling subscriber can input a plurality of destination addresses (i.e., repeating steps 407, 408, and 409), and a plurality of called subscribers are grouped. Once the destination address end key is selected (affirmative decision in step 410), a determination is made as to whether the transmit key is selected (step 411). If the transmit key is selected (affirmative decision in step 411), the controller 1 will transmit the short message group registration information with a burst format through the RF circuit 5 (step 412). The RF circuit 5 modulates the short message group registration information into a radio signal.

The radio signal (which is modulated with either the short message information (step 316, FIG. 3B) or the short message group registration information (step 412, FIG. 4)) is transmitted from the GSM terminal 10 to the BTS 114. The BTS 114 demodulates the radio signal into a short message signal. The short message signal is transmitted to the MSC 100 through the BSC 112. The MSC 100 transmits the short message signal to the subscriber authenticator 140. The subscriber authenticator 140 detects a GSM terminal number and retrieves GSM terminal numbers stored in the HLR 160 to determine whether the detected GSM terminal number is a registered number. If the GSM terminal 10 is authenticated as a registered terminal, the MSC 100 is switched to a service center address detector 130 to detect the service center address. The MSC 100 receives the detected service center address and is switched to the corresponding service center. Moreover, the MSC 100 matches the short message through the short message service gateway 170 and transmits the short message to the short message service center 180.

Referring now to FIG. 7, a block diagram illustrates the short message service center. A gateway circuit 740 detects either the short message information or the short message group registration information from the short message signal received from gateways 1, 2, and 3, and provides an interface for input/output signals. A group identifier detector 750 detects a group identifier from the short message information or short message group registration information detected from the gateway circuit 740, and transmits the detected group identifier to a controller 710. A short message detector 760 detects a short message from the short message information or the short message group registration information. A subscriber number detector 770 detects called subscriber numbers corresponding to the group identifier. A tone generator 730 generates a tone signal and transmits the tone signal to the gateway circuit 740. A memory 720 stores program code for operating the short message service center and stores a short message for a prescribed time. The controller 710 controls the overall operation of the short message service center and causes the group identifier detector 750 to detect the group identifier. The controller 710 also causes the tone generator 730 to transmit the tone signal to a called subscriber number included in the detected group identifier.

A method of operation of the short message service center will now be discussed with reference to FIG. 7 and FIG. 5 which is a flow diagram that illustrates a short message transmitting procedure of the short message service center. The controller 710 of the short message service center (FIG. 7) determines whether a short message signal is received from the gateway circuit 740 (step 501). Upon

receiving the short message signal (affirmative result in step 501), the controller 710 determines if the short message signal includes either short message information or short message group registration information (step 502). If the short message signal includes the short message information (affirmative result at step 502), a determination is made as to whether the short message information is a group transmission mode (step 503). On the other hand, if the short message signal includes the short message group registration information (negative decision in step 502), the controller 710 will execute a short message group registration mode routine (step 510) (as discussed in further detail below with reference to FIG. 6). If the short message information is a group transmission mode (affirmative decision at step 503), the controller 710 causes the short message detector 760 to detect the short message and the detected short message is stored in memory 720 (step 504). If the short message information is not a group transmission mode (negative decision in step 503), the controller 710 will execute a normal short message mode (step 511).

Once the short message is stored (step 504), the controller 1 causes the group identifier detector 750 to detect the group identifier from the short message information (step 505). A determination is then made as to whether the detected group identifier exists in the memory 720 (step 506). If the group identifier exists in memory 720 (affirmative decision at step 506), the controller 710 reads from memory 720 the called subscriber numbers of the corresponding group (step 507). However, if the detected group identifier does not exist in the memory 720 (negative result at

step 506), the controller 710 transmits a group registration error signal to the GSM terminal (step 512).

After the called subscriber numbers are read from memory (step 507), the controller 510 causes the tone generator 730 to transmit DTMF signals corresponding to each of the called subscriber numbers (step 508). The short message is then transmitted to each of the called subscriber numbers via the gateway circuit 740 (step 509). For example, assuming that the GSM terminals 20, 30 and 40 (FIG. 1) have subscriber numbers that are associated with the group identifier, the short message will be transmitted to those terminals.

Referring now to FIG. 6, a flow diagram illustrates a short message group registration mode routine (step 510 of FIG. 5) in accordance with one aspect of the present invention. If the short message signal received by the short message service center (FIG. 7) includes the short message group registration information, the controller 710 will execute a short message group registration mode routine (step 510, FIG. 5). In FIG. 6, initially, the controller 710 determines whether the short message signal received from the gateway circuit 740 includes the short message group registration information (step 601). If so (affirmative result at step 601), the controller 710 causes the group identifier detector 750 to detect the group identifier and causes the subscriber number detector 770 to detect the called subscriber numbers (step 602). The controller 710 then stores the called subscriber numbers in corresponding addresses that are associated with and/or assigned to the detected group identifier (step 603).

In summary, the short message can be simultaneously transmitted to a plurality of called subscribers without having to repeatedly transmit the same short message at successive times. Consequently, the time required for transmitting a short message to a plurality of called subscribers is significantly reduced by utilizing the methods herein.

Although the illustrative embodiments of the present invention have been described herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments, and that various other changes and modifications may be affected therein by one skilled in the art without departing from the scope or spirit of the invention. All such changes and modifications are intended to be included within the scope of the invention as defined by the appended claims.

WHAT IS CLAIMED IS:

1. A method for transmitting a short message to a plurality of subscribers in a mobile communication system, comprising the steps of:

5 registering a plurality of called subscriber numbers in a short message service center of said mobile communication system by associating each of said plurality of called subscriber numbers with a group identifier; and

simultaneously transmitting said short message to each of said plurality of called subscriber numbers by designating said group identifier.

10 2. In a mobile communication system having a plurality of base station subsystems for demodulating signals received from a plurality of corresponding mobile communication terminals and a mobile switching center, operatively connected to said plurality of base station subsystems, for detecting a short message service center number from said demodulated signals and for switching to a corresponding short message service center through a gateway, said short message service center having a memory, a method for transmitting a short message to a plurality of subscribers, comprising the steps of:

15 transmitting short message information from one of said mobile communication terminals, said short message information including a group identifier and a short message;

detecting, by said short message service center, said group identifier from said short message information; and

simultaneously transmitting said short message to subscriber numbers associated with said detected group identifier.

5 3. The method of claim 2, wherein said step of transmitting said short message information from said mobile communication terminal includes the steps of:

displaying a plurality of menus;

10 selecting a short message service menu from said plurality of displayed menus;

displaying a first set of sub-menus associated with said short message service menu, said first set of sub-menus including a short message transmission mode and a short message group registration mode sub-menu;

15 instructing a calling subscriber to input a short message service center number in response to selecting said short message transmission mode sub-menu;

displaying a second set of sub-menus associated with said short message transmission mode, said second set of sub-menus including a group transmission mode and a normal transmission mode sub-menu;

20 inputting said group identifier and said short message if said group transmission mode is selected; and

transmitting a short message signal including said short message service center number, said group identifier and said short message.

4. The method of claim 3, wherein said short message signal is transmitted by actuating a transmit key of said mobile communication terminal.

5. The method of claim 3, wherein said step of inputting said group identifier and said short message includes the substeps of:

instructing a calling subscriber to input said group identifier;

determining if said group identifier is input;

storing said input group identifier in a memory of said mobile communication terminal;

instructing said calling subscriber to input said short message;

determining if a short message end signal is input; and

storing said short message in said memory of said mobile communication terminal if said short message end signal is input.

6. The method of claim 3, wherein said plurality of menus are displayed by actuating a menu key of said mobile communication terminal.

7. The method of claim 2, wherein said step of detecting said group identifier from said short message information includes the substeps of:

determining if said short message information is received;

determining if said short message information is a group transmission mode or a normal short message mode when said short message information is received;

detecting said short message from said short message information and storing said short message if said short message information is a group transmission mode; and

detecting said group identifier from said short message information.

8. The method of claim 2, wherein said step of simultaneously transmitting said short message includes the substeps of:

determining if said detected group identifier exists in said memory of said short message service center;

reading from said memory subscriber numbers corresponding to said detected group identifier if the detected group identifier exists in said memory; and

dialing said subscriber numbers read from said memory to transmit said short message thereto.

9. A method for transmitting a short message to a plurality of subscribers in a mobile communication system, comprising the steps of:

transmitting from a mobile communication terminal a short message registration signal including a short message service center number, a group identifier and at least one subscriber number;

detecting, by a short message service center, said group identifier from said short message registration signal; and

registering said transmitted subscriber numbers in said short message service center in accordance with said detected group identifier.

10. The method of claim 9, wherein said step of transmitting said short message registration signal comprises the steps of:

displaying a plurality of menus;

selecting a short message service menu from said plurality of displayed menus;

displaying a first set of sub-menus associated with said short message service menu, said first set of sub-menus including a short message transmission mode and a short message group registration mode;

instructing a calling subscriber to input a short message service center number in response to selecting said short message group registration mode sub-menu;

inputting said group identifier and said subscriber numbers; and

transmitting said short message signal including said short message service center number, said group identifier and said subscriber numbers.

11. The method of claim 10, wherein said step of inputting said subscriber numbers includes the steps of:

5

inputting a desired subscriber number;

determining if a subscriber number end key is actuated; and

instructing a caller to input another desired subscriber number if said subscriber number end key is not actuated.

12. The method of claim 11, wherein said step of transmitting said short message signal includes the steps of:

10

determining if a transmit key is actuated when said subscriber number end key is actuated; and

transmitting said short message signal upon actuation of said transmit key.

15

13. The method of claim 9, further comprising the step of storing said detected group identifier from said short message registration signal.

14. The method of claim 9, wherein said step of registering said transmitted subscriber numbers comprises the steps of:

detecting said transmitted subscriber numbers;

assigning a plurality of addresses corresponding to the detected group

5 identifier; and

storing each of said subscriber numbers in a corresponding one of said assigned addresses.

ABSTRACT OF THE DISCLOSURE

A method for transmitting a short message to a plurality of subscribers in a mobile communication system. Upon detecting the selection of a short message service menu, a mobile communication terminal transmits short message information including a group identifier and a short message. A short message service center detects the group identifier from the short message information, reads subscriber numbers corresponding to the group identifier from its memory, and simultaneously transmits the short message to the called subscriber numbers.

5

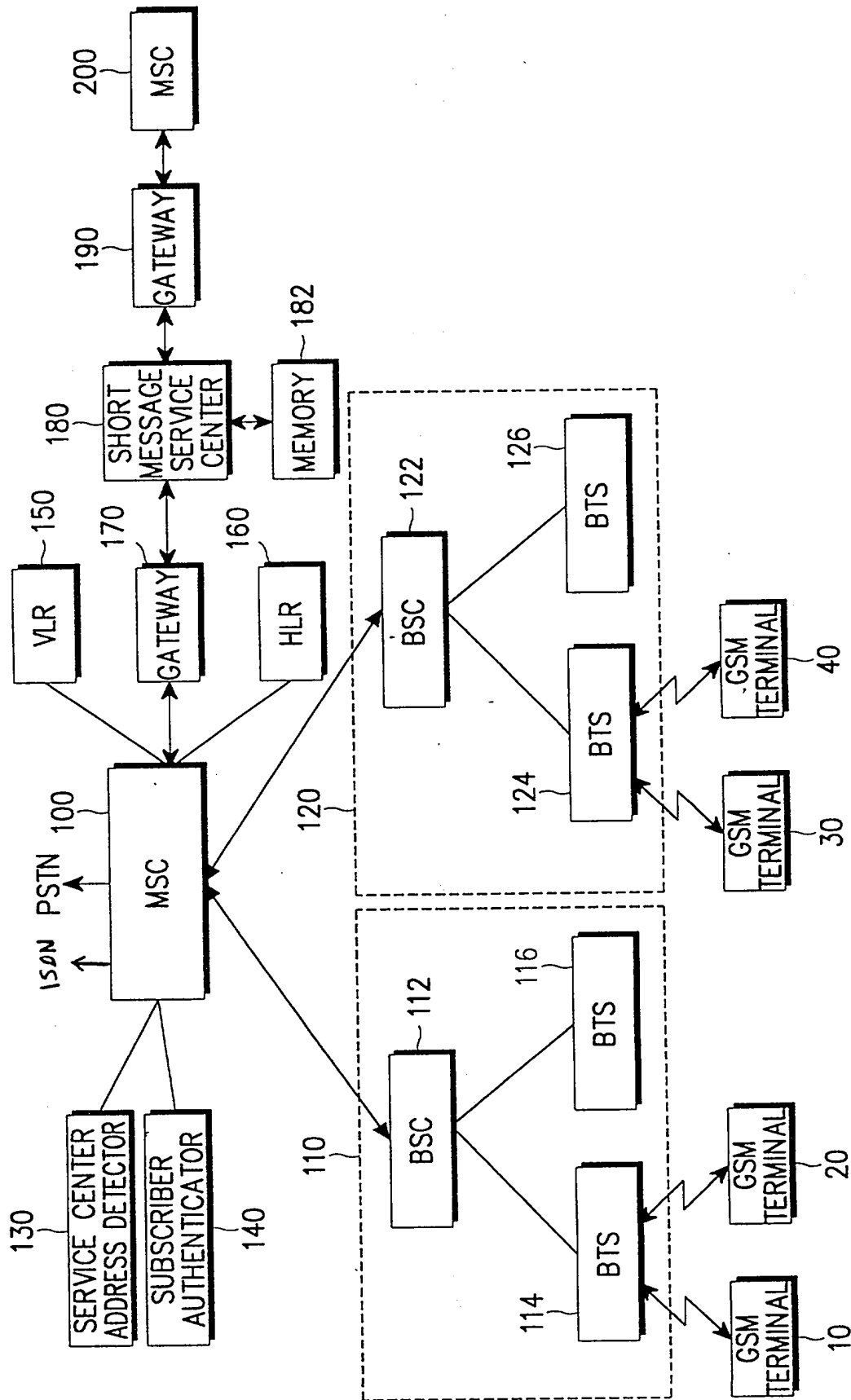


FIG. 1

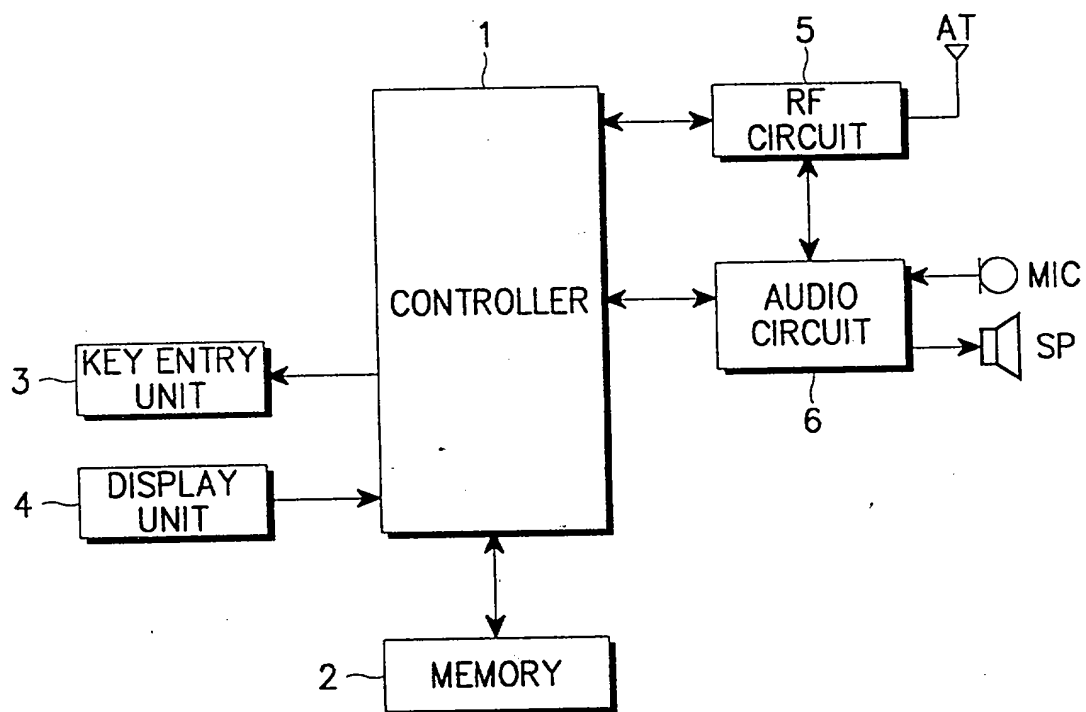


FIG. 2

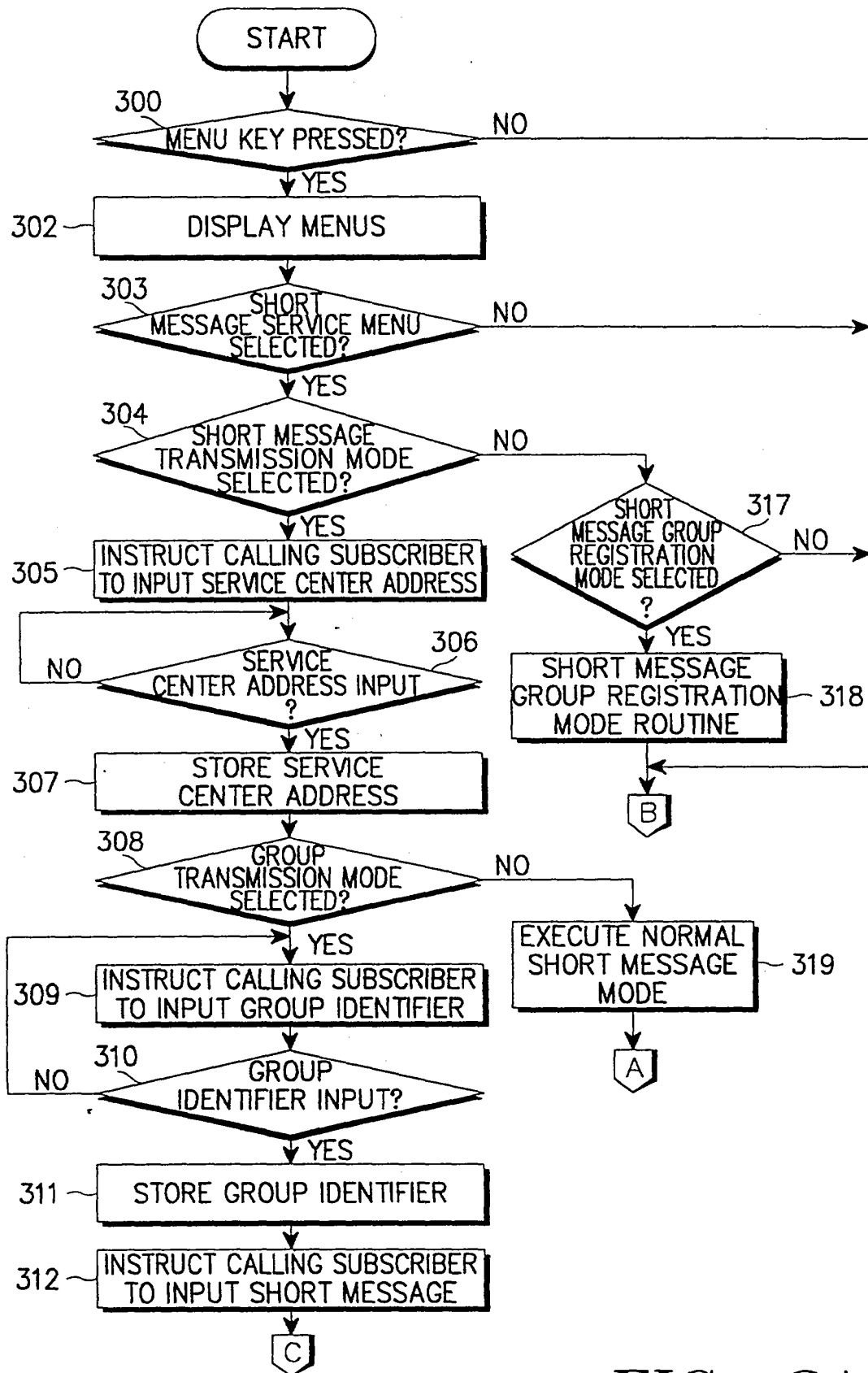


FIG. 3A

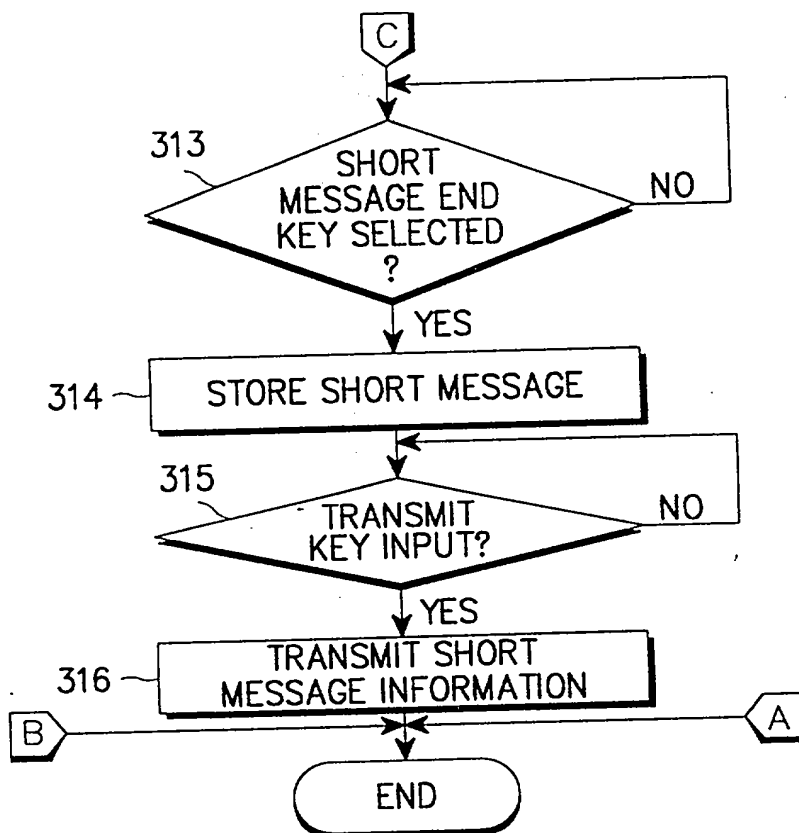


FIG. 3B

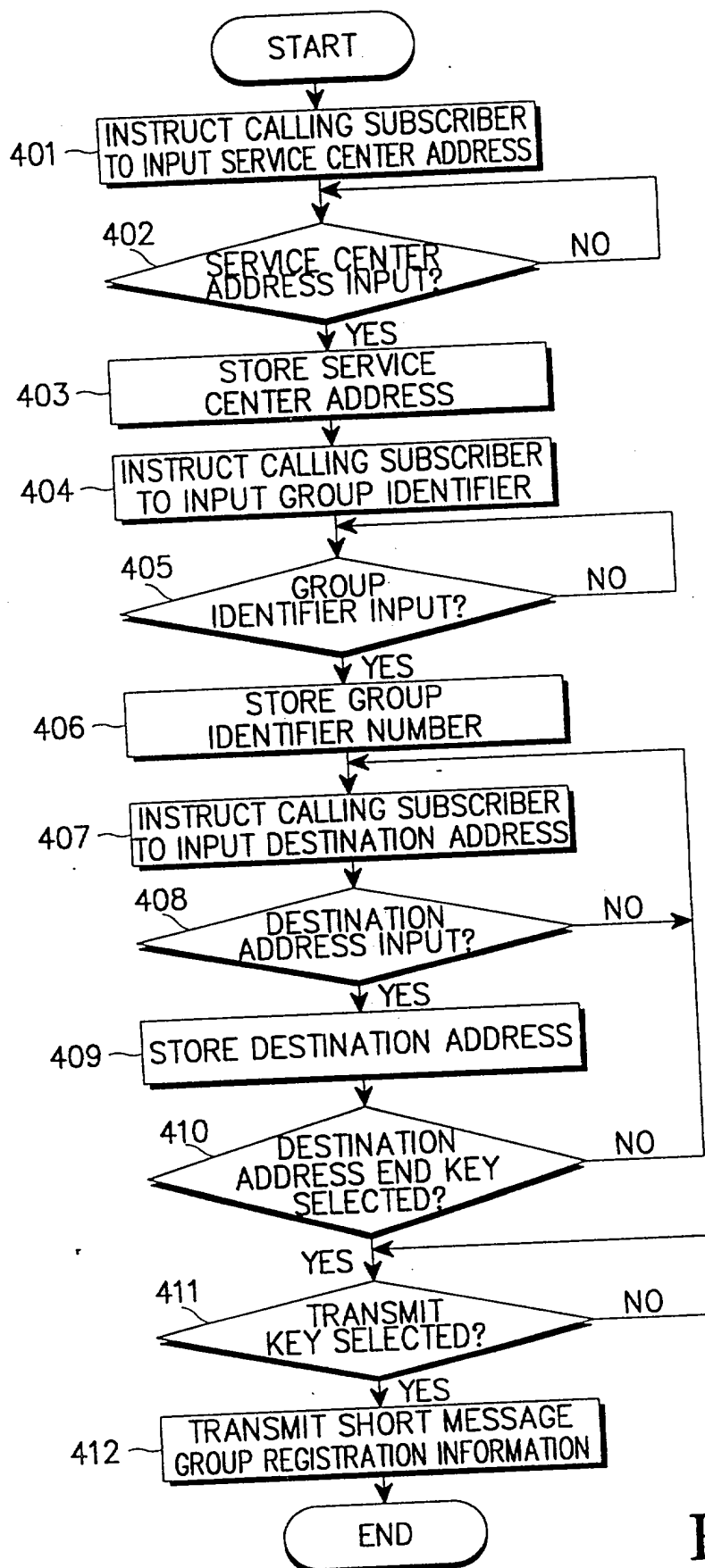


FIG. 4

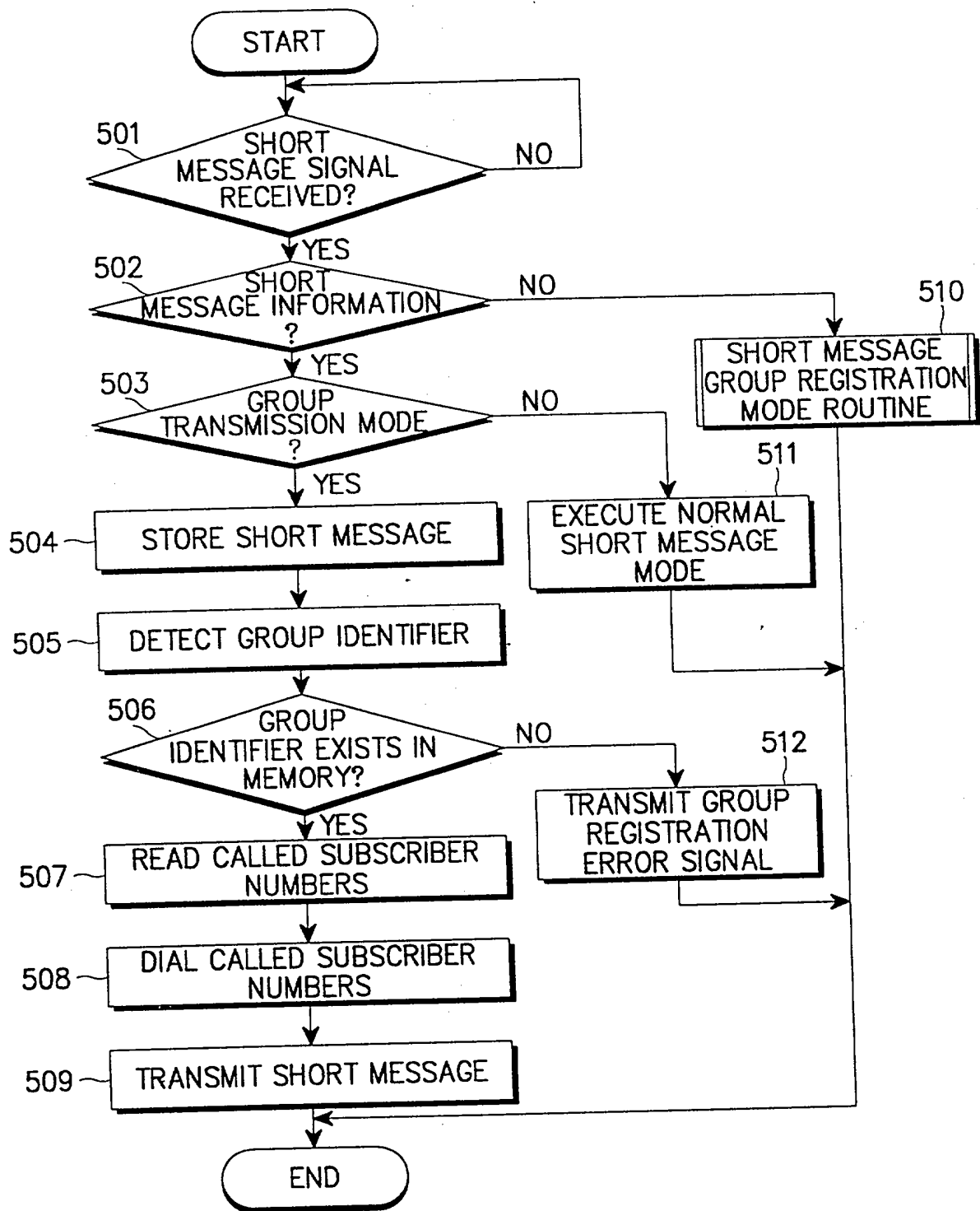


FIG. 5

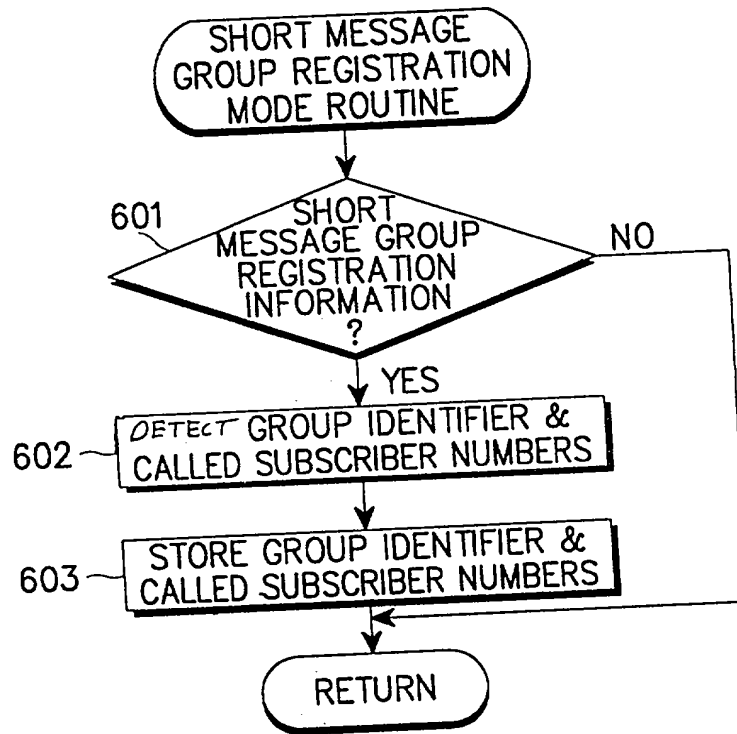


FIG. 6

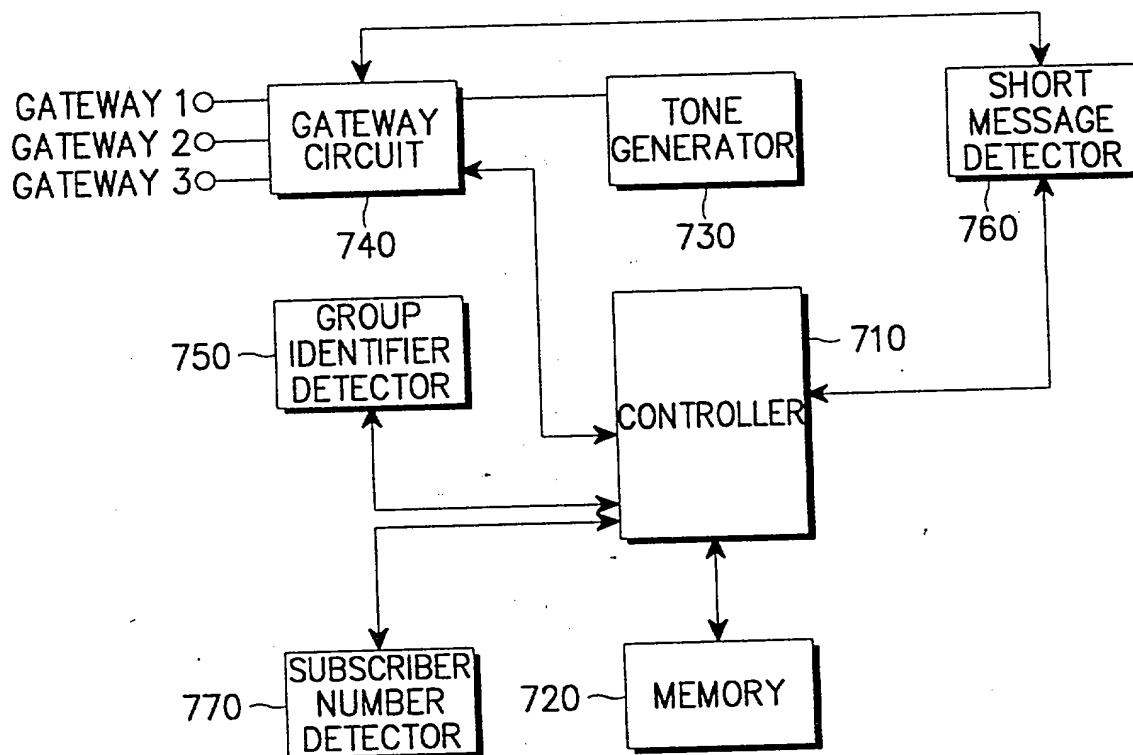


FIG. 7

AS A BELIEVING INVENTOR, I hereby declare that:

My residence, office, business and citizenship are as stated next to my name.

I believe that I am the original first and sole (if only one name is listed below), or an original, first and joint inventor (if plural names are listed below), of the subject matter which is claimed and for which a patent is sought on the invention entitled:

TITLE: METHOD FOR TRANSMITTING SHORT MESSAGE TO CALLED SUBSCRIBERS

the specification of which either is attached hereto or otherwise accompanies this Declaration, or:

☐ was filed in the U.S. Patent & Trademark Office on _____ and assigned Serial No. _____.

☐ and (if applicable) was amended on _____.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability and to the examination of this application in accordance with Title 37 of the Code of Federal Regulations §1.56. I hereby claim foreign priority benefits under Title 35, U.S. Code §119(a)-(d) or §365(h) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States, or §119(c) of any United States provisional application(s), listed below and have also identified below any foreign applications for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Priority Claimed:

<u>1997-38430</u>	<u>Korea</u>	<u>12 August 1997</u>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
(Application Number)	(Country)	(Day/Month/Year filed)	

_____	_____	_____	Yes <input type="checkbox"/> No <input type="checkbox"/>
(Application Number)	(Country)	(Day/Month/Year filed)	

_____	_____	_____	Yes <input type="checkbox"/> No <input type="checkbox"/>
(Application Number)	(Country)	(Day/Month/Year filed)	

I hereby claim the benefit under Title 35, U.S. Code, §120, of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of Title 35, U.S. Code, §112, I acknowledge the duty to disclose information material to patentability as defined in Title 37, The Code of Federal Regulations, §1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

_____	_____	_____
(Application Serial Number)	(Filing Date)	(STATUS: patented, pending, abandoned)

_____	_____	_____
(Application Serial Number)	(Filing Date)	(STATUS: patented, pending, abandoned)

I hereby appoint the following attorneys: PETER G. DILWORTH, Reg. No. 26,450; ROCCO S. BARRESE, Reg. No. 25,253; DAVID M. CARTER, Reg. No. 30,949; PAUL J. FARRELL, Reg. No. 33,494; PETER DELUCA, Reg. No. 32,973; FRANK CHAU, Reg. No. 34,136; ADRIAN T. CALDERONE, Reg. No. 31,746; GEORGE M. KAPLAN, Reg. No. 28,375; JEFFREY S. STEEN, Reg. No. 32,063; JOSEPH W. SCHMIDT, Reg. No. 36,920; RAYMOND E. FARRELL, Reg. No. 34,816; RUSSELL R. KASSNER, Reg. No. 36,183; CHRISTOPHER G. TRAINOR, Reg. No. 39,517; GLENN F. SAVIT, Reg. No. 37,437; GEORGE LIKOUREZOS, Reg. No. 30,067; JAMES M. LOEFFLER, Reg. No. 37,873; WILLIAM E. LEWIS, Reg. No. 39,274, and JOHN G. TUTUNJIAN, Reg. No. 39,405, to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected therewith and with any divisional, continuation, continuation-in-part, reissue or re-examination application, with full power of appointment and with full power to substitute an associate attorney or agent, and to receive all patents which may issue thereon, and request that all correspondence be addressed to:

Frank Chau, Esq.
DILWORTH & BARRESE
333 Earle Ovington Boulevard
Uniondale, New York 11555 Area Code: 516-228-8484

BY DECLARE that all statements made herein of my own knowledge are true and that all statements made on information
belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and
like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 U.S. Code and that such willful false
statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF FIRST OR SOLE INVENTOR: Roe-Kwan KIM Citizenship Korea
Inventor's signature: Roe Kwan Kim Date: August 11, 1998
Residence & Post Office Address: 14-1, Nongseo-ri, Kihung-up, Yongin-shi, Kyonggi-do,
Korea

FULL NAME OF SECOND JOINT INVENTOR: _____ Citizenship _____
Inventor's signature: _____ Date: _____
Residence & Post Office Address: _____

FULL NAME OF THIRD JOINT INVENTOR: _____ Citizenship _____
Inventor's signature: _____ Date: _____
Residence & Post Office Address: _____

FULL NAME OF FOURTH JOINT INVENTOR: _____ Citizenship _____
Inventor's signature: _____ Date: _____
Residence & Post Office Address: _____

FULL NAME OF FIFTH JOINT INVENTOR: _____ Citizenship _____
Inventor's signature: _____ Date: _____
Residence & Post Office Address: _____

FULL NAME OF SIXTH JOINT INVENTOR: _____ Citizenship _____
Inventor's signature: _____ Date: _____
Residence & Post Office Address: _____